

National Institute of Ecology (Mexico)
Projects for Recovery of Priority Species

Project for the Conservation and Management
of Jaguars in Mexico
(March 2006)

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Title and Contents: Skipped (pages 1-7)

Summary: (page 8)

Goals: Develop a plan that will lead to recovery of the Jaguar in Mexico.

Objectives:

- Evaluate the current status of the jaguar in Mexico
- Determine threats
- Determine the priority conservation actions

Natural History Description: Skipped (pages 9-21)

Conservation strategy: (pages 22-38)

Destruction of habitat has been identified as the greatest threat for the conservation of the jaguar. Six strategies with specific actions have been identified: research, management planning, management, environmental education, enforcement, and legislation and administration.

Conservation of priority areas: the subcommittee will identify by state, priority areas and within those the best conserved. The subcommittee will promote the conservation of those areas and biological corridors to connect them through the following actions:

1. Use GIS models to identify the criteria for an area to be designated as a priority.
2. Promotion of natural protected areas of importance to jaguar conservation
3. Discourage destruction of the ecosystem by grazing and agriculture by developing natural resource management strategies that provide less destructive land use options.
4. Develop site specific management plans for priority areas
5. Establish programs for the management of fire and forestry and land use change.
6. Create national, regional, and local programs that focus on educating the public about the importance of natural protected areas using jaguars as the flagship animal.

Conservation of jaguars in the priority areas: assure protection of jaguars in the protected areas through the following actions:

1. The development of a law enforcement program to get rid of poaching and the commercialization of specimens, products and parts.

2. The adjustment or development of management plans so that jaguar conservation is included.
3. Promotion of changes in livestock practices to reduce depredation and the subsequent responses by those affected.
4. Develop an environmental education program for the citizens that live in association with the jaguar so that they understand the value of the jaguar and the laws that protect it.
5. Develop a jaguar research program in these areas.
6. Establish a depredation fund to compensate ranchers who lose livestock to jaguars

Research: The most pressing research needs are to understand the population ecology of the species and to monitor the status of the jaguar in priority areas. To better manage the jaguar we recommend:

1. Establish research protocols that will make research comparable. Develop methods that are relatively cheap to monitor populations and understand population status in less studied areas.
2. Develop a protocol to estimate jaguar density in different ecosystems
3. Develop research and monitoring programs for the jaguar and its habitat as well as to document poaching, illegal trafficking or destruction of habitat.
4. Research is needed to understand population density, habitat requirements, home range size and use, and density in relation to prey. Radio telemetry should be used to better understand home range, population size, depredation events, and impact on local economies. This research is especially needed for disturbed areas where human/jaguar encounters most often occur.
5. Determine the status of the jaguar in priority areas.
6. Genetic studies are needed for populations in Mexico.
7. Need to learn more about availability and selection of prey, as well as the effect of prey availability on jaguar density. This is important because in many areas poaching, habitat destruction and other competing human uses have eliminated much of the jaguar's prey. The effect on jaguar populations is unknown but is suspected to be a strain.
8. Use modern techniques to study food habits, like the study of stomach acid and DNA to help identify prey.
9. Identify studies that will help us to better understand the overall distribution of the jaguar.
10. Research into the socioeconomic aspects of jaguar conservation, especially the impact of depredation.
11. Investigate the role that disease plays in the conservation of the jaguar: including emerging diseases impact on population dynamics, factors that predispose jaguars to get disease (genetic, nutritional, immunological), and the relation of sickness of animals in captivity and in the wild.
12. Develop protocols that standardize the collection and analysis of biological samples in the field as well as in captivity, which will serve as the basis for studies of routine health and research into the dynamics of disease.
13. Identify institutions and resources that are willing to facilitate the study of disease.
14. Create a centralized information bank from the results of all research.

Development of management plans:

1. Promote the creation of management plans in priority areas that don't have them
2. Assure that these management plans are inline with proposed protocols established by the subcommittee.
3. Revise existing plans: so that they are inline with the proposed protocols, so that they consider the jaguar as an important part of the ecosystem and take into account the jaguar's needs for prey and cover, and ensure that future improvements in these areas don't affect the jaguar.
4. Hold meeting to make sure that all parties understand the protocols and that they are incorporated into the management plans.
5. The subcommittee will make recommendations related to management actions taken in the priority areas.

Law Enforcement: Should not only be related to poaching and illegal trade but also actions to protect the habitat of this species. The goal of law enforcement should be to protect the priority areas and combat poaching and illegal trade. This can be accomplished by adding more officers in the states where the jaguar occurs. Among the activities to develop are the following:

1. The subcommittee in collaboration with federal, state and local authorities will identify the areas where the majority of infractions occur. Using the results obtained the subcommittee will provide to the appropriate authorities the actions necessary to minimize and eradicate the problem.
2. The subcommittee will look for inter-institutional ways to answer questions on a large scale, like fire control and land use change and ensure communication between all government organizations.
3. Develop law enforcement training programs for government employees on the national and local level as well as for the citizens that live in rural communities. With the objective of preparing highly qualified people to protect and help conserve the jaguar and its habitat.
4. The research group in collaboration with the education group will promote the integration of local citizen police groups into the protection and conservation of the jaguar and its habitat.
5. The subcommittee in collaboration with the authorities and local citizen police groups will create, and revise periodically, an action plan that will detail inspection dates and routes in jaguar priority areas.
6. This action plan will also specify the administrative strategy in the event that illegal activities are confirmed that are negatively affecting the jaguar or its habitat.

Management

Management of jaguars in the wild as well as in captivity, of their habitat, or other human activities that affect the jaguar or its ecosystem, that are based on sound techniques and proven knowledge are efficient tools that can be the greatest contribution to the conservation of the species.

Livestock management: In this type of management conflict is common between the jaguar and livestock, which frequently results in the illegal hunting of problem animals. A large part of this conflict can be solved with appropriate livestock management activities. To prevent livestock depredation it is important to develop and implement preventative measures, which include herd management activities. This is especially important in areas where the jaguar can easily hunt domestic animals. It is estimated that 33% of livestock deaths are juvenile animals. We also know that the jaguar hunts mostly in areas that have lots of cover and water. The preventative actions for livestock management are as follows:

1. Remove young or sick animals from areas of abundant vegetation, especially if jaguars are thought to be in the area.
2. Manage livestock in a controlled manner, so that they are kept in enclosures or rotated to different pastures under a watchful human presence, especially when jaguars are in the area.
3. Transport food to a more protected and controlled areas.
4. Synchronize birthing activities so that they are kept to a minimum, and protect the females as they are particularly vulnerable to depredation during this time.
5. Other most costly methods can also be implemented, like the instillation of solar powered electric fences, and the clearing of brush to create a corridor around livestock areas. These types of preventative measures have had success in the southwestern United States, so their implementation in the northwest of Mexico and probably in other parts of the country would probably be feasible. In any case extra vigilance is needed when moving livestock.

Translocation of jaguars between populations is often used as a technique for management and conservation of jaguars; it can also be a method to remove animals that have come into conflict with humans.

In Mexico it is necessary to develop a protocol for the translocation of problem jaguars. The protocol will seek to establish the mechanisms and criteria to ensure success. The following should be considered:

1. The capture and translocation of jaguars is justified only for research and management of the species (security, population control, or problem animals). Capture and translocation carry a certain risk for the animal captured, as well as social or ecological risks if the animal is released in an area that has not been sufficiently evaluated. Translocation should be carefully evaluated with a feasibility study being that existing reports show that translocations are inefficient because the animals return to the areas of capture or initiate conflict with human activities. In any case it is necessary that local authorities are aware of any such actions.
2. It is necessary to create a manual of procedures for the capture and translocation of jaguars, which will be given to the appropriate authorities and will be a requirement to follow for any action that involves translocation. Even though the document will serve as a guide, it will also be necessary to determine the feasibility of said actions in the case of

problem jaguars. This evaluation should be written and turned into the appropriate authorities, who will give the appropriate authorization.

3. When jaguars depredate domestic animals, they should be the objects of management action that may include capture and radio tagging and subsequent release, to verify that it is a reoccurring problem. If the same conduct persists, the animal should be recaptured and translocated, or placed in captivity, or hunted in a legal format.
4. The subcommittee will create a list of handlers specialized in the capture and translocation of jaguars, that will be available to the authorities.

Finally elimination of problem jaguars should be the last option. It is an extreme but effective method that should be taken with much precaution, previous documentation, analysis and evaluation in each case. The subcommittee will create a protocol for this procedure.

When elimination of a problem jaguar is authorized, the action should be taken that will have a social benefit and the greatest positive effect for the conservation of the species; hunting as a sustainable use of this natural resource and as a means of control. It is important to show that in our country we can successfully manage populations when they turn harmful, as in the black bear and the wild sheep in the Gulf of California. These examples have shown that when management actions include the take of problem animals and the opportunity to control these animals is given a monetary value, it can be an efficient instrument for conservation and benefit the local people financially.

Management of wild populations

According to their natural history jaguars require large areas to survive. For this reason a minimum viable population of jaguars requires large areas of appropriate habitat and sufficient prey density to survive. Much of jaguar habitat has been fragmented and isolated.

According to estimates from other countries, populations of jaguars consist of only 50 or 60 animals. However, the effective population size is much smaller. According to simulations in Vortex, populations of 300 or more animals have a 97% chance to survive for the long term.

The effective population size for a population of this size has been estimated to be 40 to 80 % of the total population. This signifies that small populations have even less of a chance of survival in the long term. Given that the number of small populations is growing due to human activity, active management programs are required in these areas to prevent extinction.

The management of small populations isn't simple and requires that we know the level of genetic diversity in each program to maximize diversity. In some cases management actions may require the movement of genetic material, such as impregnating females from small populations with gametes from larger populations to maximize the diversity in small populations. At other times it may be necessary to move particular animals. This will depend on the particular conditions of each population.

Management in captivity

As part of the project it is necessary to develop a management plan for individuals in captivity, so that we know what is happening with these individuals, the problems with their maintenance and the successful strategies for keeping captive jaguars.

The management plan should include:

1. Number of individual and sex
2. Data about the origin of each animal, genetic and genological
3. Type of cage and space available
4. Food and diet
5. Sickness and preventative medicine programs
6. Reproduction and contraception
7. Survival and cause of death
8. Management of seized or donated animals
9. Behavior and welfare
10. Development of research projects linked between captivity and the wild.

This will allow us to define the priorities for the maintenance and management of captive jaguars.

Legislation and Administration

Various activities at the governmental level can promote the conservation of this cat. Some of these include: updating the judicial framework, creation of financing mechanisms for conservation activities and management, development of sustainable use of this species, fiscal incentives, obtaining control over priority areas through buying, renting or conservation easements. If necessary declaring areas as natural protected areas, and the promotion of other uses of natural resources. It is also necessary to develop a restitution strategy for depredation.

Sustainable use

Sustainable use can have two forms, extractive and non-extractive. The first imply the removal of the jaguar, the second can be considered activities such as ecotourism.

Sustainable use is one of the fundamental instruments in conservation. In this way both social and conservation goals are reached and people learn to value the natural riches of the tropical forest, including the jaguar. Currently sustainable use of the jaguar is limited to non-extractive use, such as zoos or ecotourism.

The majority of people that live in areas with jaguars have negative feelings about them. They consider jaguars a threat, which usually leads to elimination of the problem, or the death of the

cat. However, the option to develop ecotourism in areas with jaguars can lead to incentives for the local inhabitants to conserve the habitat.

Although it is now illegal, we should consider the sustainable harvest of jaguars as a viable possibility, since this can be used as a management tool for the conservation of the species. At every moment this type of use should be guided by the protocols outlined by the subcommittee. Nevertheless, the priority is for other management actions., before proceeding to an extractive use. Use of captive jaguars is realized through exhibition in zoos and for their reproduction.

Fiscal incentives

The subcommittee will look for help from the authorities with the objective of creating mechanisms to obtain fiscal incentives and incentives for private property owners that maintain jaguars and conserve there ecosystem, as well as for institutions, partnerships and programs dedicated to the conservation and study of this cat.

Control of priority areas

The administration and use of priority areas in one of the most effective strategies to guarantee conservation of the jaguar. Many option exist, from the buying of these lands, to renting them and setting up agreements for the conservation of wild areas.

Cattle insurance

Cattle insurance is an instrument that should be evaluated, tested and then adjusted, so that in practice jaguars aren't eliminated using the argument that they depredate cattle. This will lead to better protection of the cattle and environmental education on a local level, in which changes in cattle management can be introduced.

It is necessary to create a fund or establish some economic mechanism that compensates the villagers and the ranchers for losses due to jaguars or pumas. IT is also necessary to create a team of experts with knowledge about depredation that will review the cases of suspected depredation and make a final ruling if the kill was from a jaguar or puma. The fund should also cover the work of the experts.

The development of the cattle insurance should be regional and work with the communities to achieve a compromise and approval of the local inhabitants as well as their help in the conservation of the jaguar as they continue their agriculture lifestyle. Indemnity should be given to the villagers and ranchers that comply with the management practices that minimize the risks of depredation, which practices the subcommittee will outline in a manual.

As part of the cattle insurance program we will try to capture and relocate jaguars or pumas that repeatedly kill cattle. This will be done according to the prorotcol for the translocation of problem jaguars. The team of experts will maintain contact with the local inhabitants who will report the incidents and details of a kill and then the experts will decide when the jaguar has

become a problem. Only a team recognized by the environmental authorities will capture and relocate problem jaguars. When it is possible radio collars will be attached to these animals as they are released. The authorities along with the managers involved will decide to where the animal will be translocated.

Other than the protection of the jaguars and other wildlife, this instrument should offer a clear social benefit that generates awareness about the importance of the jaguar and other predators, contributing along with environmental education and law enforcement to the discouraging of poor livestock management practices. Cattle insurance can be a source of information for the researcher, being that once it is established, reports about depredation will be public.

Payment for depredation will be defined by study and local conditions, and it is recommended that the price be less than market price. To create this fund it is required to raise funds or work with an insurance company.

As a first step it is proposed that the subcommittee help institutions and groups interested in the jaguar conservation to fundraise in order to obtain funds for compensation. Cattle insurance will necessitate a coordinated effort from this group.

Environmental Education

Part of the problem associated with jaguar conservation and other species is that there is a lack of knowledge about the value (cultural, economic, aesthetic and biological) that a species has. In many cases ignorance about the role of the jaguar in the ecosystem, or about its habits and behavior leads to the development of practices that are incompatible with the conservation of the species. In this sense it is important to develop activities that defend promote and educate local communities and society in general about the importance of this cat and its conservation, as well as the practices that will allow us to live in harmony with this species.

This will require a great effort on all levels. The subcommittee should mount a campaign of communication and education that uses all types of media to realize to levels of understanding.

1. At a local scale procure respect for the species using means and messages that are suitable for this environment (pamphlets, workshops, videos, radio, presentations, conferences, etc.)
2. At the national level, use mass media with messages and language that is accessible to all.

The environmental education group will also create a webpage for communication between subcommittee members but that will also allow interested parties to learn about the basic aspects of the conservation and management of the species.

The following actions are required to augment knowledge of the people about the importance of the jaguar and predators in general and to change the attitude of society:

1. A survey about attitudes and beliefs (customs, traditions, etc...) should be carried out within the population that inhabits key sites for the conservation of the jaguar. This will result in an education program based on the information.
2. Select appropriate content and media by which to broadcast to the public.
3. To realize an effective program and optimize resources, it is necessary to define an objective of the program.
4. In each of the areas of importance for the jaguar, specific conservation problems that occur as the jaguar interacts with the local communities should be defined. Once the problems area defined education reflective of these problems can be carried out.
5. We should work with zoos and other education venues, because they already have the personnel with education abilities who can work with families or school children.
6. Carryout technical courses for environmental educators, taught by carnivore or jaguar experts and those responsible for the environmental education campaign.
7. Create education materials (games, education packets, videos, photos, pamphlets, murals, calendars, etc...) and give them to zoos, schools, conservation groups, scientists, and interested persons that have contact with communities inhabited by the jaguar, so that they distribute the materials.
8. Compile and generate histories and stories about the jaguar
9. Organize and promote events (Day of the jaguar, contests, conferences, and talks)
10. In rural areas use radio, talks, and round tables with the community and printed, visual materials.
11. In urban areas use fairs and other public events, use radio and television, pamphlets, other printed works and the internet.
12. It is required to have the participation of experts to carry out the program
13. Train teachers, environmental educators, volunteers, etc... who will be responsible for carrying out the environmental education
14. Evaluate the situation of the rural communities in the priority jaguar areas
15. Compile existing information about previous work in jaguar environmental education.

Literature Cited and Subcommittee Charter: Skipped (pages 39-59)